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PATENT APPLICATION

ATTORNEY DOCKET NO. 60003206-1IN THE
UNITED STATES PATENT AND TRADEMARK OFFICE

Inventor(s): Garcia et al.

Confirmation No.: 7849

Application No.: 09/941,884

Examiner: Nguyen, Lam S

Filing Date: 08/28/2001

Group Art Unit: 2863

Title: DIAGNOSTIC FOR VISUAL DETECTION OF MEDIA ADVANCE ERRORS

Mail Stop Appeal Brief-Patents
Commissioner For Patents
PO Box 1450
Alexandria, VA 22313-1450

TRANSMITTAL OF APPEAL BRIEF

Transmitted herewith is the Appeal Brief in this application with respect to the Notice of Appeal filed on 11/13/2007
and notice of decision on pre-appeal brief review mailed 1-3-08.☒ The fee for filing this Appeal Brief is \$510.00 (37 CFR 41.20).☐ No Additional Fee Required.

(complete (a) or (b) as applicable)

The proceedings herein are for a patent application and the provisions of 37 CFR 1.136(a) apply.

☐ (a) Applicant petitions for an extension of time under 37 CFR 1.136 (fees: 37 CFR 1.17(a)-(d)) for the total number of months checked below:☐ 1st Month
\$120☐ 2nd Month
\$460☐ 3rd Month
\$1050☐ 4th Month
\$1640☐ The extension fee has already been filed in this application.☐ (b) Applicant believes that no extension of time is required. However, this conditional petition is being made to provide for the possibility that applicant has inadvertently overlooked the need for a petition and fee for extension of time.Please charge to Deposit Account 08-2025 the sum of \$ 510. At any time during the pendency of this application, please charge any fees required or credit any over payment to Deposit Account 08-2025 pursuant to 37 CFR 1.25. Additionally please charge any fees to Deposit Account 08-2025 under 37 CFR 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.☐ A duplicate copy of this transmittal letter is enclosed.☐ I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to:
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Respectfully submitted,

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**PATENT
60003206-1**

JAN 31 2008

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

In re Application of:

GARCIA et al.

Serial No. 09/941,884

Filed: 08/28/2001

For: **DIAGNOSTIC FOR VISUAL
DETECTION OF MEDIA
ADVANCE ERRORS**

) Art Unit: 2853

) Examiner: Nguyen, Lam S.

APPEAL BRIEF

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
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In re Application of:

Garcia et al.

Serial No. 09/941,884

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For: **DIAGNOSTIC FOR VISUAL
DETECTION OF MEDIA
ADVANCE ERRORS**

Art Unit: 2853

Examiner: Nguyen, Lam S.

APPEAL BRIEF

Commissioner for Patents
P.O. Box 1450
Alexandria, VA

Sir,

This appeal is taken from the Office's final rejection of Claims 2, 4, 5, 7, 11, 13, 14 and 16 mailed August 16, 2007, in the subject application.

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I. REAL PARTY IN INTEREST.

The real party in interest is the assignee, Hewlett-Packard Development Company, L.P.

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II. RELATED APPEALS AND INTERFERENCES.

There are no related appeals, interferences or judicial proceedings known to appellants, the appellants' legal representative, or assignee.

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III. STATUS OF ALL THE CLAIMS.

Claims 1-22 were filed with this application. During the course of prosecution before the Primary Examiner, Claims 1, 3, 6, 8-10, 12, 15, 17-22 were cancelled. Claims 2, 4, 5, 7, 11, 13, 14 and 16 in their present, amended form appear in Appendix I to the Appeal Brief, and are the only claims remaining in this case.

Claims 2, 4, 5, 7, 11, 13, 14 and 16 are at issue in this appeal.

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IV. STATUS OF ALL AMENDMENTS FILED SUBSEQUENT TO
FINAL REJECTION.

No amendments have been filed subsequent to the final rejection mailed
August 16, 2007.

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V. SUMMARY OF CLAIMED SUBJECT MATTER.

The page and line numbers referred to herein are to the specification; reference characters are found in the drawing. References to the specification are by [page #:line number(s)].

Independent Claim 1 is drawn to a diagnostic method for visual detection of poor media advance calibration in an ink-jet printing system, comprising:

- entering a diagnostic mode of the printing system in which mode normal printing jobs of the printing system are not printed [9:4-7; FIG. 13, 200; FIG. 14, 220];

- printing different areas of a diagnostic pattern at different passes of one or more ink-jet printheads with a controlled amount of media advances between the passes, to accumulate media advance error between the printing of the different areas [FIG. 13, 208; FIG. 14, 222; 9:4 to 15-9]; and

- examining the diagnostic pattern to determine whether the accumulated media advance error is sufficiently objectionable to take corrective action [FIG. 13, 208; FIG. 14, 228]; and

wherein said printing different areas comprises [15:18 to 16:9; FIGS. 11-12]:

- printing a first area comprising a first set of pixels printed during a first pass;

- conducting a plurality of incremental media advances;

- printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area.

Claim 11 is drawn to a diagnostic method for visual detection of poor media advance calibration in an ink-jet printing system, comprising:

- providing an ink-jet printhead [38, FIG. 2] mounted on a carriage [31, FIG. 2], the carriage mounted for movement along a scan axis [15; FIG. 2];

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providing a media advance system [35; FIG. 3] for advancing a print medium [33; FIG. 3] along a media path [13; FIG. 3] which is transverse to the scan axis;

entering a diagnostic multi-pass print mode in which mode normal printing jobs of the printing system are not printed [9:4-7; FIG. 13, 200; FIG. 14, 220];

printing different areas of a diagnostic plot at different passes using said ink-jet printhead with a controlled amount of media advances between the passes to accumulate media advance error between the printing of the different areas [FIG. 13, 208; FIG. 14, 222; 9:4 to 15:9]; and

examining the diagnostic plot to determine whether the accumulated media advance error is sufficiently objectionable to take corrective action [FIG. 13, 208; FIG. 14, 224]; and

wherein said printing different areas comprises [15:18 to 16:9; FIGS. 11-12];

printing a first area comprising a first set of pixels printed during a first pass;

conducting a plurality of incremental media advances;

printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area.

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VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL.

The grounds of rejection to be reviewed on appeal are:

(i) whether Claims 2-5 and 11-14 are unpatentable under 35 USC 103(a) over Arquilevich et al. (6,137,592, "Arquilevich") in view of Dunand (6398334); and

(ii) whether Claims 7 and 16 are unpatentable over Arquilevich in view of Dunand and Maeda ("Maeda") (US 6,334,659).

These are the grounds of rejection as set out in the office action of August 16, 2007.

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VII. ARGUMENT.

For purposes of this appeal, appellants are content to stand on the differences between the claimed invention and the applied references discussed below, because these differences are sufficient to establish that a prima facie case of obviousness has not been established, and the applied references do not teach or suggest appellants' invention. Appellants do not concede, however, that other differences do not exist.

A. The Requirements of 35 USC §103.

"The key to supporting any rejection under 35 U.S.C. §103 is the clear articulation of the reason(s) why the claimed invention would have been obvious." (MPEP 2142) As noted in KSR International Co. v. Teleflex Inc., 82 USPQ2d 1385, 1396 (2007), the analysis supporting a rejection under 35 U.S.C. 103 should be made explicit. "Rejections on obviousness cannot be sustained with mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." *In re Kahn*, 441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006).

All words in a claim must be considered in judging the patentability of that claim against the prior art (MPEP 2143.03). If an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious.

Appellants submit that the Primary Examiner has not established prima facie that the claimed invention would have been obvious in view of the applied references, and that the references do not teach or suggest the claimed invention.

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B. A Prima Facie Case of Obviousness Has Not Been Established.

1. Claims 2, 4-5, 11 and 13-14 -- rejected as being unpatentable over Arquilevich in view of Dunand.

Claim 2:

Claim 2 is drawn to a diagnostic method for visual detection of poor media advance calibration in an ink-jet printing system, comprising:

[A] entering a diagnostic mode of the printing system in which mode normal printing jobs of the printing system are not printed;

[B] printing different areas of a diagnostic pattern at different passes of one or more ink-jet printheads with a controlled amount of media advances between the passes, to accumulate media advance error between the printing of the different areas; and

[C] examining the diagnostic pattern to determine whether the accumulated media advance error is sufficiently objectionable to take corrective action; and

wherein said printing different areas comprises:

[D] printing a first area comprising a first set of pixels printed during a first pass;

[E] conducting a plurality of incremental media advances;

[F] printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area. (Subparagraph designations added for convenience)

The references do not describe or render unpatentable the method defined by Claim 2.

Arquilevich is drawn to a method for adjusting drive roller linefeed distance.

"A difference in feed roller diameter from one printer to another causes a media to advance by a different amount for a given rotation of a drive

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shaft to which the feed roller is coupled. Such variation in advance distance is a linefeed error. Mean linefeed error is determined and corrected by printing a test plot having several areas. Each area is formed of the same image pattern, but is printed at a different linefeed error adjustment to compensate for mean linefeed error. The different adjustments are prescribed and span a typical compensation range for a given print engine model. The different adjustment factors cause banding to occur in some areas. The user picks one of the test pattern areas which has the highest print quality (i.e., least or no banding). The linefeed adjustment factor corresponding to such area is used for normal printing." (Abstract)

The Office asserts at pages 2-3 of the office action that Arquilevich discloses "printing different areas of a diagnostic pattern at different passes of one or more ink-jet printheads with a controlled amount of media advances between the passes between the printing of the different areas, (*FIG. 5 and columns 6, lines 35-45*)," and that said printing different areas comprises "printing a first area comprising a first set of pixels printed during a first pass; conducting a plurality of incremental media advances; printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line (*FIG. 5 and columns 6, lines 35-45*)."

Applicants respectfully disagree. Arquilevich does not disclose at least the features of paragraphs B, D, E or F of Claim 2.

FIG. 5 of Arquilevich discloses several test plots, each printed with a different linefeed error adjustment. However, none of the plots show printing different areas of a diagnostic pattern at different passes of one or more ink-jet printheads with a controlled amount of media advances between the passes between the printing of the different areas, wherein said different areas are nominally aligned along a horizontal line. Arquilevich does not describe that a given horizontal line of any one of the areas (82, 84, 86, 88, 90) is printed using different passes of the printhead with a controlled amount of media advances between the passes, and, particularly that media advance errors resulting from the plurality of media advances are accumulated between printing the first area and printing the further area.

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Nor does the Office point out how FIG. 5 of Arquilevich shows a method as recited in Claim 2, wherein the different areas are nominally aligned along a horizontal line. In the "Response to Arguments" section of the final rejection, the Office stated, with applicants' comments noted in bold:

The applicant argued that Arquilevich did not teach wherein the different areas are nominally aligned along a horizontal line. In response, the examiner cites that as clearly shown in Arquilevich's FIG. 5, the test plot has a plurality of non-overlapping areas formed using a different value of the swath height error adjustment. (*Claim 1; column 10, lines 35-40*). **[Note: the plurality of non-overlapping areas referred to here are not nominally aligned along a horizontal line.]** The non-overlapping areas read on the different claimed areas because they are formed at different passes (swaths) of the inkjet head (*FIG. 2, element 3*) with the pass (swath) height error adjustment, wherein in a scanning type inkjet printers, a media sheet is fed incrementally at a controlled amount as a printhead scans across the media sheet (*column 1, lines 13-16*) **[Note: media sheet is not described as being fed incrementally as the printhead scans across the media when printing the test plot. Nor is there any description of operations corresponding to paragraphs E and F in Claim 2]** Moreover, Arquilevich's FIG. 5 also shows the non-overlapping areas aligned along a horizontal line. **[The Office has not described which non-overlapping areas of FIG. 5 are aligned along a horizontal line. Applicants submit that FIG. 5 does not support this allegation.]**

Thus, these asserted references to Arquilevich by the Office do not address all features of Claim 2, for example, those in paragraphs D, E and F. There is no description of conducting a plurality of media advances between printing a first area and a second area, wherein "said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area." Claim 1, column 10, lines 35-40, of Arquilevich, referenced by the Examiner, certainly does not describe this feature. FIG. 5 of Arquilevich does not show the features of Claim 2.

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Dunand is cited for allegedly disclosing "a process of printing on a printing medium in which the printing medium is advanced plurality of times in order to form a printed pattern by an ink jet printing system, wherein an advancing error is accumulated, and the printed pattern is examined to determine whether the accumulate media advance error is sufficiently objectionable to take corrective action (*column 10, line 22-26: If the accumulated advance error reaches a half of a nominal advance, the program will choose to use the reference mark to print the next band*), wherein the step of examining the diagnostic pattern is conducted by an optical sensor (*column 7, lines 39-42*)."

Dunand describes a process for compensation of a defect in the advance of a print substrate by modifying the arrival position of ink droplets with a variable electrical charge on the substrate. Each band of droplets is printed with a mark on the margin or edge of the substrate, the substrate is advanced to print the next band, an algebraic difference is determined between a nominal theoretical position of the mark and the real position of the mark, a correction to the value of the charge voltage to be applied to each droplet to compensate for the position error is determined, and the substrate correction is applied to each droplet in the next band, in addition to the nominal voltage. (Abstract) Thus, the printing of the mark is performed during printing of normal print jobs, and not during a diagnostic mode in which normal printing jobs of the printing system are not printed, see paragraph A of Claim 2.

It is undisputed that Dunand does not disclose the features of paragraphs D, E and F of Claim 2.

The Office asserts that it would have been obvious to modify the method of Arquilevich to include determining whether an accumulated media advance error is sufficiently objectionable to take corrective action as allegedly disclosed by Dunand, and that the motivation of doing so would have been to correct misalignment defects caused by the differences between the real advance of the printing system and its nominal advance as allegedly taught by Dunand.

Applicants respectfully disagree, and point out that there is no reasoned statement as to how Arquilevich would be modified. Arquilevich describes a diagnostic plot performed to illustrate the effects of different line advance distances, or different swath height error adjustment distances, affect the image quality, so the user can visually inspect the various areas in FIG. 5 to pick the one with the best image quality. Arquilevich does not address how to determine when

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the error is sufficiently objectionable to take corrective action. By conducting a plurality of media advances between printing different areas, the advance errors are accumulated, thereby increasing the effect of accumulated errors and the apparent visual effect. See paragraph [0010] of applicants' specification.

Because there is no apparent modification of Arquilevich which one of ordinary skill would undertake to arrive at the claimed subject matter, and all claim limitations are not present in the references, a prima facie case of obviousness of Claim 2 has not been established.

Claim 11:

Claim 11 is drawn to a diagnostic method for visual detection of poor media advance calibration in an ink-jet printing system, comprising:

[A] providing an ink-jet printhead mounted on a carriage, the carriage mounted for movement along a scan axis;

[B] providing a media advance system for advancing a print medium along a media path which is transverse to the scan axis;

[C] entering a diagnostic multi-pass print mode in which mode normal printing jobs of the printing system are not printed;

[D] printing different areas of a diagnostic plot at different passes using said ink-jet printhead with a controlled amount of media advances between the passes to accumulate media advance error between the printing of the different areas; and

[E] examining the diagnostic plot to determine whether the accumulated media advance error is sufficiently objectionable to take corrective action; and

[F] wherein said printing different areas comprises:

[G] printing a first area comprising a first set of pixels printed during a first pass;

[H] conducting a plurality of incremental media advances;

[I] printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area. (Subparagraph designations added for convenience)

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For reasons similar to those discussed above regarding Claim 2, applicants respectfully submit that the applied references do not teach or suggest the subject matter of Claim 11. For example, the combination of references does not describe any of elements G, H and I.

Claims 4, 5, 13 and 14:

The rejections of the dependent claims which depend from Claims 2 and 11 should also be reversed, as depending from an allowable base claim.

2. Claims 7 and 16 – Rejected as being unpatentable over Arquilevich in view of Dunand and Maeda.

This ground of rejection is respectfully traversed, for reasons discussed above regarding Claims 2 and 11. A prima facie case of obviousness has not been established.

Claim 7 depends from Claim 2, and further recites that the step of printing different areas of a diagnostic plot includes:

applying a diagnostic multi-pass print mode mask, wherein a plurality of carriage passes are employed to print the area subtended by a printhead nozzle array, the diagnostic print mode mask comprising a rectilinear grid of pixels, with each pixel location having a number associated therewith, the number representing the pass in which the pixel will be printed, and wherein said different areas include a first set of pixels on a row of said grid, and a second set of pixels on said row, and wherein said first set of pixels is printed on a different pass than said second set of pixels is printed.

Claim 16 depends from Claim 10, and further recites that the step of printing different areas of a diagnostic plot includes:

applying a diagnostic multi-pass print mode mask, wherein a plurality of carriage passes are employed to print the area subtended by a printhead nozzle array, the diagnostic print mode mask comprising a rectilinear grid of pixels, with each pixel location having a number associated therewith, the number representing the pass in which the pixel will be printed, and wherein said different areas include a first set of pixels on a row of said

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grid, and a second set of pixels on said row, and wherein said first set of pixels is printed on a different pass than said second set of pixels is printed.

The Examiner agrees that Arquilevich and Dunand do not disclose the features of dependent Claims 7 and 16. Maeda is cited as allegedly applying a diagnostic multi-pass print mode mask. Appellants respectfully disagree with the recitation of the alleged teachings of Maeda. The embodiment illustrated in FIGS. 7-10 of Maeda is directed to the problem of an ink drawing phenomenon causing bleeding, resulting from laying down a dot right next to a just previously deposited dot. By depositing respective dots in a checkerboard fashion, the ink drawing phenomenon is said to be avoided. FIGS. 10A-10D show the technique of checkerboard printing using respective mask patterns. See, Maeda at 10:35 to 11:54. The passages of Maeda cited by the Examiner do not pertain to a "diagnostic plot," or a "diagnostic multi-pass print mode mask," but rather to techniques of printing to avoid bleed during normal print operations.

Because Arquilevich and Dunand admittedly do not show the features of Claims 7 and 16, and because Maeda does not supply the missing teachings of these claims, a prima facie case of obviousness has not been established. Appellants respectfully submit that the combination of references to form the grounds for the rejection is the product of improper hindsight reconstruction.

The Examiner further states that it would have been obvious to include the applying of a diagnostic multi-pass print mode mask as allegedly disclosed by Maeda into the advance control process as disclosed by Arquilevich as modified, and that the motivation for doing so is to reduce the formed bind pitch to less than paper transport width without increasing the number of scans, so that banding artifacts are imperceptible as taught by Maeda at 4:4-10. The problem addressed by Maeda has nothing to do with the problem of media advance errors, and so the motivation asserted by the Examiner would not lead one to the solution set out in Claims 7 and 16.

The rejection of Claims 7 and 16 should be reversed.

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VII. SUMMARY

The rejections under 35 USC § 103 must be reversed. A prima facie case of obviousness has not been made, and the cited references do not describe, teach or suggest the claimed subject matter.

Respectfully submitted,



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APPENDIX I

Claim 1. (Canceled)

2. (Previously Presented) A diagnostic method for visual detection of poor media advance calibration in an ink-jet printing system, comprising:

entering a diagnostic mode of the printing system in which mode normal printing jobs of the printing system are not printed;

printing different areas of a diagnostic pattern at different passes of one or more ink-jet printheads with a controlled amount of media advances between the passes, to accumulate media advance error between the printing of the different areas; and

examining the diagnostic pattern to determine whether the accumulated media advance error is sufficiently objectionable to take corrective action; and

wherein said printing different areas comprises:

printing a first area comprising a first set of pixels printed during a first pass;

conducting a plurality of incremental media advances;

printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area.

Claim 3. (Canceled)

4. (Previously Presented) The method of Claim 2, wherein said step of examining the diagnostic pattern is conducted visually by a user.

5. (Previously Presented) The method of Claim 2, wherein said step of examining the diagnostic pattern is conducted by an optical sensor comprising the printing system.

Claim 6. (Canceled)

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7. (Previously Presented) The method of Claim 2, wherein said step of printing different areas of a diagnostic plot includes:

applying a diagnostic multi-pass print mode mask, wherein a plurality of carriage passes are employed to print the area subtended by a printhead nozzle array, the diagnostic print mode mask comprising a rectilinear grid of pixels, with each pixel location having a number associated therewith, the number representing the pass in which the pixel will be printed, and wherein said different areas include a first set of pixels on a row of said grid, and a second set of pixels on said row, and wherein said first set of pixels is printed on a different pass than said second set of pixels is printed.

Claim 8. (Canceled)

Claim 9. (Canceled)

Claim 10. (Canceled)

11. (Previously Presented) A diagnostic method for visual detection of poor media advance calibration in an ink-jet printing system, comprising:

providing an ink-jet printhead mounted on a carriage, the carriage mounted for movement along a scan axis;

providing a media advance system for advancing a print medium along a media path which is transverse to the scan axis;

entering a diagnostic multi-pass print mode in which mode normal printing jobs of the printing system are not printed;

printing different areas of a diagnostic plot at different passes using said ink-jet printhead with a controlled amount of media advances between the passes to accumulate media advance error between the printing of the different areas; and

examining the diagnostic plot to determine whether the accumulated media advance error is sufficiently objectionable to take corrective action; and

wherein said printing different areas comprises:

printing a first area comprising a first set of pixels printed during a first pass;

conducting a plurality of incremental media advances;

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printing a further area comprising a second set of pixels printed during a further pass, wherein said different areas are nominally aligned along a horizontal line, and wherein media advance errors resulting from said plurality of media advances are accumulated between printing said first area and printing said further area.

Claim 12. (Canceled)

13. (Previously Presented) The method of Claim 11, wherein said step of examining the diagnostic pattern is conducted visually by a user.

14. (Previously Presented) The method of Claim 11, wherein said step of examining the diagnostic pattern is conducted by an optical sensor comprising the printing system.

Claim 15. (Canceled)

16. (Previously Presented) The method of Claim 11, wherein said step of printing different areas of a diagnostic plot includes:

applying a diagnostic multi-pass print mode mask, wherein a plurality of carriage passes are employed to print the area subtended by a printhead nozzle array, the diagnostic print mode mask comprising a rectilinear grid of pixels, with each pixel location having a number associated therewith, the number representing the pass in which the pixel will be printed, and wherein said different areas include a first set of pixels on a row of said grid, and a second set of pixels on said row, and wherein said first set of pixels is printed on a different pass than said second set of pixels is printed.

Claim 17. (Canceled)

Claim 18. (Canceled)

Claim 19. (Canceled)

Claim 20. (Canceled)

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Claim 21. (Canceled)

Claim 22. (Canceled)

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EVIDENCE APPENDIX

No evidence submitted pursuant to 37 CFR Sections 1.130, 1.131 or 1.132, or any other evidence entered by the Examiner, is relied upon by appellant in this appeal.

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RELATED PROCEEDINGS APPENDIX

There are no related proceedings and thus no decisions rendered in any such proceeding.